**PRACTICAL NO. 6**

**Name: Roll No.**

Area, perimeter of polygon, triangle and rotation, reflection of triangle

**1) Draw a polygon with vertices (0,0),(1,0),(2,2),(1,4) and find its area & perimeter.**

**Code:**

from sympy import\*

p1=Point(0,0)

p2=Point(1,0)

p3=Point(2,2)

p4=Point(1,4)

P=Polygon(p1,p2,p3,p4)

P

Polygon(Point2D(0,0),Point2D(1,0),Point2D(2,2),Point2D(1,4))

P.area

**Output:**

4

P.perimeter

**Output:**

1+sqrt 17+2\*sqrt (5)

**2)Draw a regular polygon with 4 sides & radius 6 centered at origin & find its area & perimeter.**

**Code:**

P=Polygon((0,0),6,n=4)

P

RegularPolygon(Point2D(0,0),6,4,0)

P.area

**Output:**

72

P.perimeter

**Output:**

24\*sqrt (2)

**3)Draw a regular polygon with 8 sides & radius 2 centered at (-1,2) is given point other than origin & find it area & perimeter.**

**Code:**

P=Polygon((1,2),2,n=8)

P

Regular Polygon(Point2D(1,2),2,8,0)

P.area

**Output:**

(64-32\*sqrt(2))/(-4+4\*sqrt(2))

P.perimeter

**Output:**

16\*sqrt(2-sqrt(2))

**5) Rotate the triangle ABC by 90 degree where A[1,-2],B[4,-6],**

**C[-1,4].**

**Code:**

from sympy import\*

A=Point(1,-2)

B=Point(4,-6)

C=Point(-1,4)

T=Triangle(A,B,C)

T

**Output:**

Triangle(Point2D(1,-2),Point2D(4,-6),Point2D(-1,4))

T.rotate(pi/2)

**Output:**

Triangle(Point2D(2,1),Point2D(6,4),Point2D(-4,-1))

**7) find the area and perimeter of triangle ABC where A[0,1],**

**B[-5,0],C[3,-3].**

**Code:**

from sympy import\*

A=Point(0,1)

B=Point(-5,0)

C=Point(3,-3)

T=Triangle(A,B,C)

print(T)

Triangle(Point2D(0,1),Point2D(-5,0),Point2D(3,-3))

T.area

**Output:**

23/2

T.perimeter

**Output:**

5+sqrt(26)+sqrt73

**8) reflect the triangle ABC through the line y=x+3 where A[-1,0],**

**B[2,-1],C[1,3].**

**Code:**

from sympy import\*

A=Point(-1,0)

B=Point(2,-1)

C=Point(1,3)

T=Triangle(A,B,C)

T

**Output:**

Triangle(Point2D(-1,0),Point2D(2,-1),Point2D(1,3))

x,y=symbols('x y')

T.reflect(Line(-x+y-3))

**Output:**

Triangle(Point2D(-3,2),Point2D(-4,5),Point2D(0,4))